EXHIBIT C

D&B ENGINEERS AND ARCHITECTS, P.C.

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August 6, 2019

Lisa Cairo, Esq.
Jaspan Schlesinger, LLP
300 Garden City Plaza, 5th Floor
Garden City, NY 11530

Re: TOH vs United States of America, et al.
16-cv-3652

Dear Ms. Cairo:

As requested, D&B Engineers and Architects, P.C. (D&B) has prepared this expert report in support of the above referenced action relating to the design and construction of the packed tower aeration system (PTAS) for treatment of groundwater contamination for Wells 7A, 8A, and Well 13 in the Levittown Water District (LWD) owned by the Town of Hempstead Department of Water ("TOH"). The report has been prepared by William Merklin, P.E., Senior Vice President at D&B. Mr. Merklin was also the Project Manager responsible for the design of the PTAS.

Starting in 2012, routine water quality samples began to exhibit low levels of contamination. By the middle of 2013, the contamination levels increased to concentrations which caused the Town to remove Wells 7A and 13 from service. Since the continued operation of these wells was critical to meet the demands of the Levittown Water District, the design and construction of a treatment facility was required. To address this need, the Town retained D&B to prepare the necessary plans and specifications for their use in procuring bids for construction of the treatment facilities. Since PTAS is a common treatment process for the removal of the detected contaminants, it was determined to be the best choice for implementation in this case.

Qualifications

This report was prepared by William Merklin, P.E., Senior Vice President of D&B Engineers and Architects, P.C. (D&B). Mr. Merklin was the Project Manager responsible for the preparation of the Design Report and Contract Plans and Specifications for the subject treatment facility. He has over 28 years of experience in the design and construction of water treatment facilities. He has designed numerous water treatment facilities on Long Island, including packed tower aeration systems similar to the subject treatment facility. Mr. Merklin's corporate resume is attached as Exhibit A.

D&B has designed and implemented over 20 granular activated carbon (GAC) and PTASs for water suppliers in Nassau County. This includes the design and construction of PTASs for the following water suppliers:

- TOH – Uniondale Water District, East Meadow Water District, Bowling Green Water District Roosevelt Field Water District and Levittown Water District
- Albertson Water District

- City of Glen Cove
- Jericho Water District
- Manhasset-Lakeville Water District
- Village of Mineola
- Port Washington Water District
- Water Authority of Great Neck North
- Village of Williston Park

Relevant Regulatory Requirements

A public water supplier is required to comply with all requirements of the New York State Department of Health Sanitary Code (Sanitary Code). The requirements for subject contaminants require a water supplier to begin the process of planning for the implementation of treatment when a contaminant concentration exceeds 50 percent of the Maximum Contaminant Level ("MCL"). In this case, when any one of the contaminants of concern exceeded 2.5 parts per billion ("ppb"), TOH was required to begin the planning and design of a groundwater treatment facility. The Sanitary Code also requires a public water supplier to remove a well from service when the concentration of one of these contaminants is 80 percent or higher than the MCL.

The Sanitary Code requires the well source capacity for a public water supply to be capable of meeting the Maximum Day Demand with the largest well out of service. This requirement provides redundancy in the overall water supply system to ensure that adequate flows and pressures can be maintained under the worst-case conditions. At the time of the evaluations of the subject wells, the historical Maximum Day Demand in the Levittown Water District was 11.11 Million Gallons per Day ("MGD"). The total actual capacity of all the operating wells, including Wells 7A, 8A and 13, was 13.55 MGD. (See Table 1.) The loss of any of the subject wells reduced the total capacity of the operating wells to 9.93 MGD. (See Table 1.) At that point in time, if the largest remaining well was to be removed from service for any reason, the total capacity of the remaining wells would have been reduced to 7.90 MGD. Since this is less than the historical Maximum Day Demand, the LWD would have been operating out of compliance with the Sanitary Code when Wells 8A and 13 were removed from service. Therefore, the operation of Wells 7A, 8A, and 13 was required to meet the demands of the LWD in accordance with the Sanitary Code.

Table 1 below summarizes the well capacities at the time Wells 8A and 13 were removed from service:

Table 1 –
Summary of Well Capacities in Levittown Water District

Well No.	Actual Capacity (MGD)
1A	0.55
2A	2.03
5A	1.34
6B	1.99
7A	1.71
8A	1.59
12	1.78
13	2.03
14	0.54
Total	**13.55**
Total with largest well out of service	**11.52**
Total with Wells 8A and 13 and largest remaining well out of service	**7.90**

Design and Implementation of PTAS for Wells 7A, 8A and 13

Wells 7A and 8A are located on Bowling Lane in Levittown, NY. Prior to commencing with this project, those wells did not require any treatment for contaminant removal.

Well 13 is located at the intersection of Entry Lane and Wantagh Avenue in Levittown, NY. Prior to commencing with this project, that well did not require any treatment for contaminant removal.

In 2013, the water quality in Wells 7A and 8A had exhibited trace concentrations of volatile organic compounds (VOC). Between the beginning of 2013 and the initial preparation of the Design Report for Packed Tower Aeration System for Wells 7A and 8A, dated August 2014 and revised February 2016 ("Design Report for Wells 7A and 8A"), increasing concentrations of 1,1 dichloroethane (1,1 DCA), 1,1,2 trichloro-1,2,2–trifluoroethane (Freon 113) and tetrachloroethene (PCE) were observed at those wells. Samples collected on May 14, 2013 exhibited concentrations of Freon 113 approaching the maximum contaminant level (MCL) of 5.0 ppb.

Starting in January 2012, the water quality in Well 13 had exhibited trace concentrations of VOCs. Between the beginning of 2012 and the initial preparation of the Design Report of Packed Tower Aeration System for Well 13, dated August 2014 and revised February 2016 ("Design Report for Well 13"), increasing concentrations of 1,1,2 trichloro-1,2,2–trifluoroethane (Freon 113) were observed. Samples collected on July 17, 2013 exhibited concentrations of Freon 113 approaching the maximum contaminant level (MCL) of 5.0 ppb.

As discussed above, a public water supplier must comply with the Sanitary Code with respect to MCLs. In this case, TOH was required to remove Well 8A from service when the concentration of any of the subject contaminants exceeded 4.0 ppb. Based on these requirements and because of the potential for an MCL violation, TOH removed Well 8A from service. With respect to Well 13, TOH was required to remove Well 13 from service when the concentration of any of the subject contaminants exceeded 4.0 ppb. Based on these requirements and because of the potential for an MCL violation, TOH removed Well 13 from service.

In June 2013, D&B was retained by TOH to prepare a design report, as well as detailed plans and specifications, and obtain required permits and provide services during construction for a treatment facility suitable to remove the contamination at Wells 7A, 8A, and 13. A copy of D&B's proposal, dated June 13, 2013, is attached hereto as Exhibit B.

During the preparation of the Design Report for Wells 7A and 8A and Well 13, D&B performed a routine 2-mile radius search in an effort to identify the possible source of VOC contamination. The identification of a source is an important step to developing the design criteria for the proposed treatment facility. No potential sources were identified within the radius of the search. However, the plume ("Grumman Plume") originating from the Northrop Grumman Systems Corporation site in Bethpage (ID# NYD002047967) ("Grumman Site") was known to exist upgradient approximately 2.5 miles north-northeast from Wells 7A, 8A, and 13. The respective Design Reports include an evaluation of the Grumman Plume as the potential source of contamination of Wells 7A, 8A, and 13. The data available at the time of the report preparation indicated the presence of the same constituents in the Grumman Plume as those observed in Wells 7A, 8A, and 13. This data is summarized and included in the Design Reports attached as Exhibits C and D

Based on the publicly available monitoring well data, the maximum VOC concentration observed in the Grumman Plume was 420 ppb of trichloroethene (TCE). Based on good engineering practice, a water treatment facility must be designed to treat the highest possible future contamination concentration anticipated in order to ensure continuous operation of the LWD public water supply wells. Therefore, the PTAS was designed to treat a maximum concentration of 420 ppb of TCE.

Having identified the anticipated contaminants and estimating the potential maximum concentrations which could impact the raw water in Wells 7A, 8A, and 13, D&B evaluated alternatives for treatment. Because of the high concentration of TCE observed in the plume monitoring wells and the presence of Freon 113, granular activated carbon (GAC) filtration was not considered a viable option for treatment. This conclusion is based on data provided by a leading GAC media manufacturer, Calgon Carbon Corporation (Calgon). Based on the assessment of D&B, it was determined that the design concentration of TCE would require frequent carbon changes, which would both periodically disrupt the operation and significantly increase the operation cost of the treatment facility. Additionally, it is our understanding that GAC has a very low affinity for removing Freon 113, rendering it ineffective for removal of this contaminant. Therefore, it is our opinion to a reasonable degree of certainty that the best available technology at the time of the preparation of the Design Reports was PTAS. Having designed other VOC treatment facilities prior to the subject facility, D&B was already familiar with the limitations of GAC for treatment of the contaminants involved with Wells 7A, 8A, and 13. For this reason, the Design Reports did not include a discussion of the treatment selection process.

Wells 7A and 8A are located within a residential neighborhood. Therefore, a goal of this project was to design the treatment facility to limit the visual impact to the surrounding community. To achieve this, the towers were installed inside of a building enclosure. Additionally, the design included the following features to reduce the overall height of the facility:

- A two-stage treatment system was utilized to effectively cut the overall height nearly in half.
- Treated water clearwells were constructed fully below grade.
- The tower bottoms are fully open, reducing the height of the tower sumps.

The full details of the final design of the Wells 7A and 8A treatment facility are included in contract plans and specifications dated February 2015 attached as Exhibit E.

The total cost for design and construction of the PTAS for Wells 7A & 8A was $5,560,300.67. Based on our experience with the cost for similar treatment facilities constructed in Nassau County, the cost for this facility is considered typical and reasonable.

The Well 13 site is located adjacent to a four-lane thoroughfare in the Levittown Community. Because of this location, TOH did not have the same concerns with respect to the visual impact to the surrounding community as with the Wells 7A and 8A site. Therefore, the packed tower for Well 13 was not installed within a building enclosure. Because the tower was not within an enclosure and due to the significant site constraints, a single tower was selected. The design included the following features to reduce the overall height of the facility to the extent possible:

- Treated water clearwell was constructed fully below grade.
- The tower bottom is fully open, reducing the height of the tower sump.

The full details of the final design of the Well 13 treatment facility are included in the contract plans and specifications dated November 2014 attached as Exhibit F.

The total cost for design and construction of the PTAS for Well 13 was $2,780,001.48. Based on our experience with the cost for similar treatment facilities constructed in Nassau County, the cost for this facility is considered typical and reasonable.

Conclusions

To summarize the analyses presented above, we provide the following conclusions to a reasonable degree of our engineering certainty:

- Since the implementation of these treatment facilities, the water delivered to the distribution system has met all requirements of the Sanitary Code. In fact, the water delivered from these facilities has consistently exhibited non-detectable concentrations of the subject contaminants since the implementation of the PTAS.

- The treatment facilities installed at Wells 7A, 8A, and 13 have, therefore, achieved the goal of meeting the Sanitary Code requirements.
- The finished treatment facilities have achieved the previously discussed goal for mitigating the negative visual impact of the facility within the residential neighborhood.
- The cost for the design and implementation of the treatment facilities are considered to be both typical and reasonable.

Compensation

Mr. Merklin's hourly rate for review and testimony is $350.00.

Other Cases in Last 4 Years

Mr. Merklin has not testified for any deposition and/or trial in the last four years.

The above information has been provided to the best of my recollection and knowledge. If you have any questions, please feel free to call me.

Very truly yours,

William Merklin, P.E.
Senior Vice President

WDM/MRDt/kb
Enclosures
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List of Exhibits

- A – Resume of William Merklin, P.E.
- B - D&B proposal dated June 11, 2013
- C - Wells 7A and 8A Design report dated August 2014 (Revised February 2016)
- D – Well 13 Design Report dated August 2014 (Revised February 2016)
- E – Wells 7A and 8A Contract Plans and Specifications dated February 2015
- F – Well 13 Contract Plans and Specifications dated November 2014